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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/918,399	07/30/2001	Peter Trefonas III	50792	4635

7590

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EXAMINER

BARRECA, NICOLE M

ART UNIT

PAPER NUMBER

1756

DATE MAILED: 01/30/2003

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/918,399

Applicant(s)

TREFONAS ET AL.

Examiner

Nicole M. Barreca

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 18-23 and 39-42 is/are rejected.
- 7) ☒ Claim(s) 6-17, 24-38, 43 and 44 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-44 are pending in this application.

Claim Objections

2. Claims 6-17, 24-38 and 43-44 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 6-17, 24-38 and 43-44 have not been further treated on the merits.

3. Please note that claim 42 as written does not exclude the composition from further comprising an acid and has been interpreted by the examiner as the antireflective composition further comprising either an acid or an acid generator compound that is a thermal acid generator compound.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 5, 18, 39, 41 and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 10-301268 (based on Derwent Abstract and the English translation from JPO).
6. JP 10-301268 discloses antireflection film material which contains a crosslinking agent, solvent and one or both of an acid compound and a basic compound (cl.1, 39, 41, 42). The antireflection film is used for forming a photoresist pattern by exposing a

Art Unit: 1756

chemical amplification resist through a mask, prebaking and then developing (cl.18).

See the Derwent abstract. The addition of the acid and/or the basic compound is controlled according to the amount of acid produced from the acid generator of the chemically amplified resist. By controlling the acidity at the interface between the resist film and the antireflective film, contraction and trailing of the resist pattern can be avoided and pattern resolution can be improved. An example of the base is N methyl pyrrolidone, which contains N and O atoms (cl.5). See also the abstract, [0015], [0026] and [0027] of the English translation.

7. Claims 1, 5, 18-20, 39-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Sinta (US Patent 5,866,102).

8. Sinta discloses antireflective coating compositions comprising a resin binder and a crosslinker, with low basicity crosslinkers, such as methoxy methylated glycouril (containing N and O atoms) being particularly preferred (cl.1, 5, 39, 40). The antireflective composition preferably further includes an acid or acid generator in order to promote the crosslinking reaction of the glycouril compound during the curing of the antireflective coating (cl.41). Preferably the acid generator is a thermal acid generator (cl.42). See col. 7, l. 31-col.8, l. 50. The antireflective coating is applied to a substrate and thermally cured, with the acid generator promoting the crosslinking (cl.19, 20). A photoresist is then applied over the antireflective surface, imaged through a mask and developed (cl.18). See col.12, 1-65.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 2-4 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 10-301268 as applied to claims 1 or 18 above, and further in view of Hatakeyama (US Patent 5,985,512).

11. JP 10-301268 teaches an antireflective composition comprising a basic material and a crosslinker, wherein the basic compound is used to control the acidity caused by the photoacid generator at the interface between the resist film and the antireflective film. While JP 10-301268 only gives a single example of a basic compound and does not disclose using a basic material having a pKa of about 3 or greater, a pKa of about 6 or greater or a pKa of about 9 or greater, the reference does teach that the basic compound is not limited to the example given in formula 3 and that the kind and amount of the basic compound will depend on the acidity of the kind of resist used. See [0028]-[0031] of English translation. Hatakeyama teaches examples of strong nitrogenous basic compounds having pKa's of at least 7, preferably 7.5 to 13, which will capture acid generated by radiation (col.3, 1-6, col.4, 30-67). It would have been obvious to one of ordinary skill in the art to add a strong basic compound having a pKa preferably between 7.5 and 13 to the antireflective composition in the method of JP 10-301268 in order to control the acidity of the resist/antireflective interface, if the kind of resist being

used required, because JP 10-301268 teaches that the choice of the basic compound is dependent on the kind of resist being used and Hatakeyama teaches that basic compounds having pKa's preferably between 7.5 and 13 are known to capture acid generated by radiation.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Scholz (US Patent 6,040,053) discloses an antireflective coating comprising an inorganic metal oxide in combination with silane or siloxane oligomer. Yoshida (US Patent 5,853,471) discloses an antireflection composition comprising an organic amine (but no crosslinking agent). Padmanaban (US Patent 6,329,117) discloses an antireflective composition comprising a polymer, crosslinking agent and a thermal acid generator. Kang (US Patent 6,465,148) discloses that resists are adversely affected when an antireflective film is too alkaline or too acidic. Ishibashi (US Patent 5,554,489) disclose applying an antireflective film, which is adjusted to alkalinity, on a photoresist layer.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nicole M. Barreca whose telephone number is 703-308-7968. The examiner can normally be reached on Monday-Thursday (8:00 am-6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Art Unit: 1756

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Nicole Barreca
Patent Examiner
Art Unit 1756

A handwritten signature in cursive script, appearing to read 'Nicole Barreca', written in black ink.

January 24, 2003